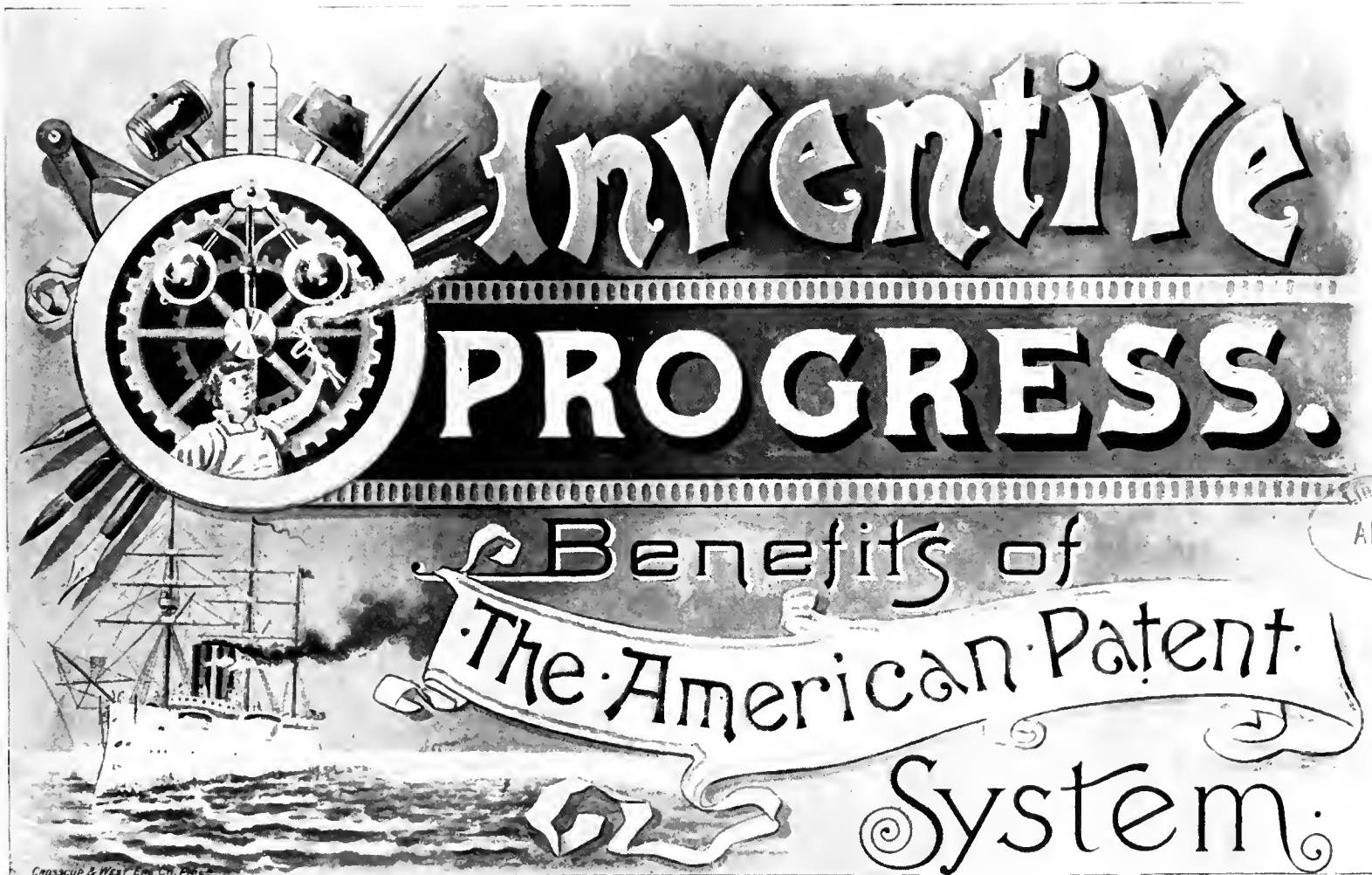


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Inventive Progress.

THE BEGINNING.



THE remarkable inventive genius developed in the United States within barely a generation may be ascribed to the robust originality of the American people, coupled with the stimulus of great financial rewards guaranteed by favorable legislation. The American patent system, which had its birth one hundred years ago, has witnessed a wizard-like transformation in mechanical appliances, in the utilization of nature's forces, and in all the conveniences and accessories of life. If we consider the stride from the primitive plow, with which the ancients tickled the soil, to the marvelous farm implements of to-day; from the burnt-brick libraries of Babylon and Ninevah to the superb treasures in movable types and sumptuous bindings that stand, piled tier on tier, in the British Museum and the Library of Congress, we may truly realize how the world has progressed. Yet the most wonderful part of this advancement has been made within the period just mentioned. During that time we have had the discovery of the telegraph, the electric light, and all the various uses of electricity. Within the same period we have seen the evolution of the printing-press from the clumsy hand-lever contrivance of Franklin's time, to the marvelous

Hoe machine which prints and folds seventy-five thousand copies of a complete eight-page newspaper in an hour. In that time the locomotive engine, the steamboat and the luxurious sleeping car have supplanted the primitive modes of travel which preceded them, and we have advanced from the old hand-spinning wheel to the wonderful weaving-looms and knitting machines of the present day. Besides all these we have had the discovery of the telephone, which conveys the human voice, in conversation, hundreds of miles; the phonograph, which records the sound of the voice and repeats its tones at the will of the operator; the sewing machine and the typewriter, which revolutionized methods in important branches of business, and even the convenient little lucifer match which replaced flint and friction. Let any man try to imagine the comparative condition of life and society if these patented discoveries had never been made, and he will measurably appreciate the benefits of the system that inspired them.

The first patent law was enacted April 10, 1790, and under it the Secretary of State, the Secretary of War and the Attorney-General were the tribunal to determine the question of granting a patent. It was not until July 10, of that

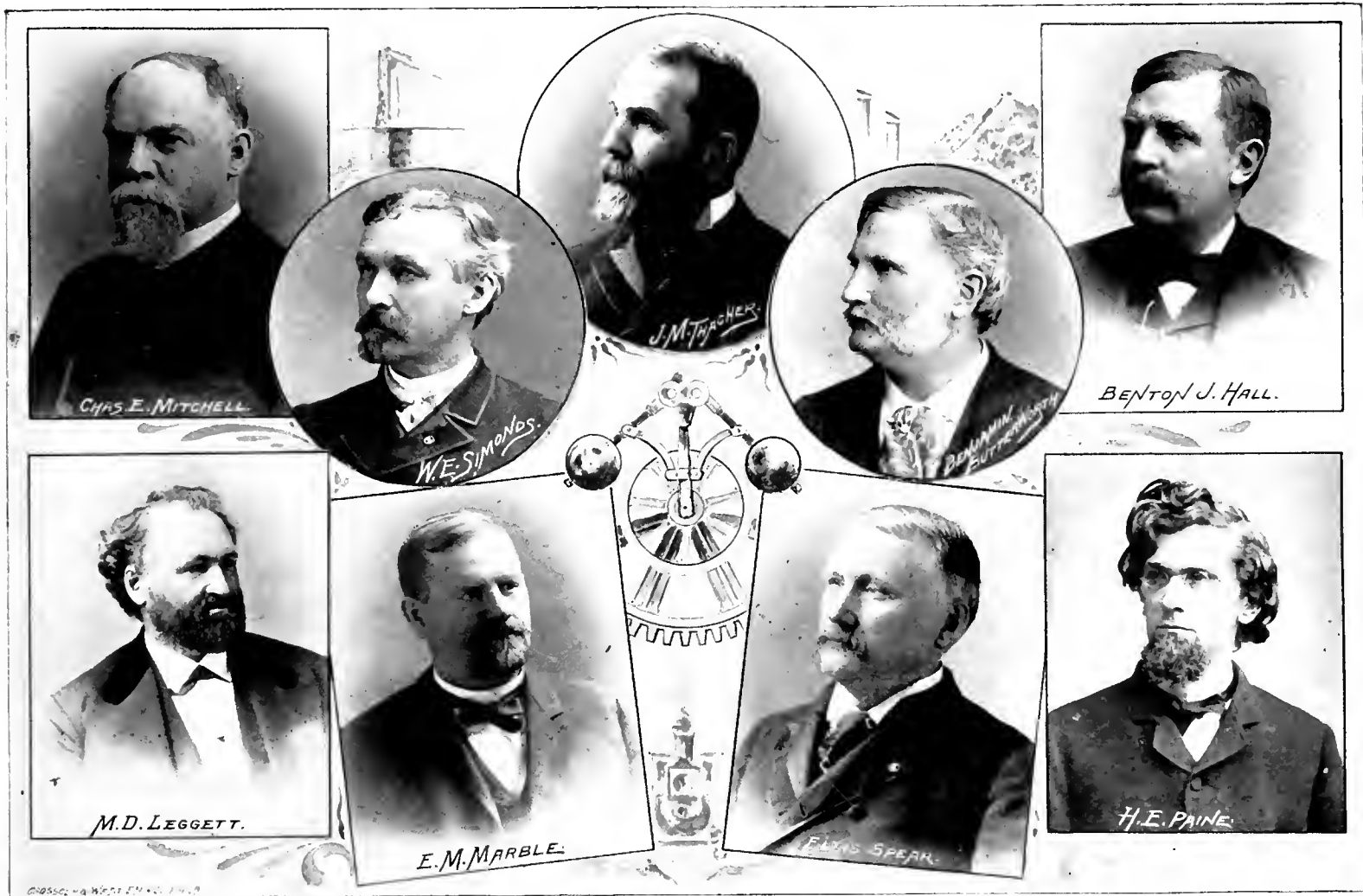
year that the first patent was issued, which was to Samuel Hopkins for a new method of making pot and pearl ashes. Since that date more than 475,000 patents have been granted. Under the law of 1790, which remained in force until February 19, 1793, only 57 patents were issued, and on the latter date a new act effecting some modifications was passed, which stood until 1836, when the great law that really created the American system and "marked an epoch" was enacted. Up to this time only 9,957 patents had been issued, while in the fifty-six years following, down to the first day of January, 1892, a total of 466,315 were granted. In the early days of the English patent system a patent granted by the Crown was not even *prima facie* evidence of novelty, but the poor inventor was obliged to maintain his claim as best he could in the courts. The American laws previous to 1836 were afflicted to some extent with similar defects, but under the new act of that year the Patent Office was vested with quasi-judicial as well as executive functions, the patent being

adjudicated upon in advance, and possessing as soon as granted the attributes of a patent which, under the old system, had been tested by expensive litigation. Thus the patent acquires an immediate commercial value, and thus, under the stimulating effect of fostering laws and large profits, inventive genius has developed and great results have been achieved. From three patents in 1790 there was a growth to 26,292 in 1890, and where one hundred years ago Franklin, a man of science, was content to leave the printing-press as he found it and as Guttenburg had left it three hundred years before, the last hundred years have seen it advanced to one of the most wonderful mechanisms in the age of wonders. And where a century ago the workman and the artisan were satisfied to jog along with such crude implements and methods as were at hand, to-day he is alert and thoughtful, looking to the attainment of better instrumentalities and a higher plane of action.

THE PATENT OFFICE.

THE United States Patent Office is one of the most important Governmental institutions. It occupies the massive Doric structure, an illustration of which appears on another page, and which is, within, a vast human beehive. It is the only bureau or department of the Government that pays its own way. In 1890 the earnings from fees amounted to \$1,340,372.66, while the total expenses were only \$1,099,297.74, leaving a surplus of \$241,074.92. The

office organization embraces a trained force of examiners, clerks, and officials, a majority of whom have been in service many years, and nearly all of whom are skilled experts possessing the highest qualifications for the work to be performed. At the present time the entire force consists of the Commissioner, who is supreme, the Assistant Commissioner, three Examiners-in-chief, thirty-two Principal Examiners, and seven Chiefs of Division, with about 550 Clerks and other



COMMISSIONERS OF PATENTS.



UNITED STATES PATENT OFFICE.

assistants, making in all 605 persons on the roll. The archives of the Office are valuable and interesting. The model-room, in the third story of the building, is a veritable curiosity shop. Here, in immense glass cases, arranged in balconies three tiers high, are stored nearly three hundred thousand models of all sorts and sizes, pertaining to all kinds of inventions. The fire of September 24, 1877, destroyed a large number of models which have never been replaced, but the collection that remains furnishes material for more than one day of interesting study. There are models of almost every implement of human use, from the Hotchkiss Machine Gun to the toy pistol, from a steam engine to a common wood screw, from the great wind mill to a bottle stopper, from a steamship to a rat-trap, from a threshing machine to an ice cream freezer, from a cradle to a tombstone, and from a brick-machine or a folding bed to a fish hook and a toy hoop. There are jumping-jacks, dosing-bottles and life-saving boats, cooking-stoves, printing-presses and gate-openers, horse shoes, railroad frogs and sausage machines, corn-planters, cornshellers and corn-extractors, fans, corset-stays, and glove fasteners world without end.

In recent years models are not generally called for and Science and Art have outgrown many of the contrivances which the model-room displays; but in their day they were regarded as perfection in the various lines for which they were designed, and made fortunes for those who invented them. There is a strikingly humorous side to Patent Office research, growing out of the many peculiar and funny

things for which patents have been obtained or sought. Among these oddities is a tape-worm trap, to be inserted through the mouth and catch the unwary tape-worm when he ventures too far off his reservation: an illuminated cat, metal cat showing eyes of fire, etc., designed to be a holy terror to rats and mice; the frontiersman's cannon-plow—beam of plow loaded with grape and canister shot, in case of sudden attack by Indians; a "cyclone-house"—house anchored at the four corners as protection against cyclones; an artificial tail for horses—to improve their appearance; a device for making hens lay—when the hen deposits her egg in the patent nest it immediately disappears into an incubator and she feels compelled to repeat herself; a steering apparatus—fan attachment to hunting-dogs' tail to enable them to turn sharp corners. These are only a few of the many similarly unique devices that might be mentioned. In the line of toys there is an endless display, some of which have been among the most profitable patents issued. The little return-ball, with a rubber string attached to the hand, drawing it back when thrown, is one of these. It made an immense fortune for the inventor, simple as it is. There are over one hundred different toy banks, some exceedingly ingenious and unique, and dolls without number.

To a novice, or one who has never given the subject thought, the great number of patents in some of the classes is surprising. Covering so simple a thing as a wood-screw, there are 97 different patents; in the class of lanterns, 945 patents, and for wash-boilers, 375 patents. For tobacco



JACOBELL HALL, U. S. PATENT OFFICE.

pipes and mouth pieces, 427 patents have been issued, and for bottle-stoppers, 539. These are among the simplest devices, but coming to the more important classes, there have been 3,570 patents issued for sewing-machines and their various attachments; for fire-arms, not including heavy ordnance, torpedo or machine guns, 3,118 patents; for car-couplings, 4,931, and for knitting and weaving machines, 4,399. For agricultural implements, including planters, harvesters, threshers, and the whole range of machines and appliances, the total number of patents is 30,776, of which 7,271 relate to plows alone. These are fair illustrations, and it is not necessary to extend

the list. It would seem that with this great number of patents, every possible improvement or device in these classes must be covered. But so it seemed to many a few years ago, when a majority of the present inventions were undiscovered; yet inventive brains have gone on developing new ideas, and more than half of all the patents issued have been granted in the last eleven years. There is actually no limit to the possibilities, but the one thing suggested by the increased complications growing out of a continued multiplication of patents is the importance to every inventor of employing the most expert, skilled, and experienced attorneys to prosecute cases in all their stages.

PROFITS OF PATENTS.

OF the nearly half a million patents issued to date, a large majority have been more or less profitable, not only returning money profits to the inventors, or their assigns, but also benefiting in a broader sense, the world at large. Many hundreds of these patents have made millionaires of their owners, while many thousands more have produced fortunes large and small. It is estimated that more than three-fourths of all the capital invested in manufactures in this country, a total of over six hundred and fifty millions of dollars, is directly or indirectly based upon patents. Of the well-known inventions that have produced enormous returns, a few examples may be cited. The sewing-machine patents not only made numerous individual fortunes, but created several large and wealthy

corporations. The telegraph patents realized an immense fortune to the original inventor and to a number of others. The Goodyear rubber patents, the original of which was a simple mixture of rubber and sulphur, formed the basis of vast manufacturing industries and gave immense wealth to hundreds of people. The McCormick harvesters and many other agricultural machines have reaped the earth's products and great wealth at the same time. The sleeping-car patents have made millions for their owners, and the electric and telephone patents have enormously enriched the inventors and all who are associated with them. These are only a few conspicuous instances, and while the list of millionaire patents, so to speak, might be increased to great length, it is not these which have realized

the greatest total of wealth. It is the thousands and tens of thousands of lesser inventions which have each brought their discoverers a few hundreds, a few thousands, or a modest fortune, that amount to the most in the aggregate and have really resulted in the greatest benefits. And it is not necessarily the wonderful invention that attains great success. Sometimes a simple little device, like the paper fastener or the common buckle, which has special utility, will make several fortunes. It should also be understood that the great aggregate of patents granted is vastly swollen by the enormous number of improvements and attachments upon the large inventions, and these may be made by any one who can. For instance, the Crane and Otis elevators

employ in their construction and operating mechanism over two hundred separate patents. The modern printing-press manufacturers own hundreds of patents which cover the various parts that go to make the complete machine, while the great electric companies have procured or purchased scores upon scores of patents necessary to the perfection of their various systems. And so it is all through the list. The field of invention is practically limitless, and great as are the rewards that have been realized by the wonderful and useful discoveries already made, still greater ones remain to be enjoyed by those who solve the numerous problems and hoped-for achievements remaining in the realm of the unattained.

FAMOUS INVENTORS.

THE names and achievements of many great inventors, whose discoveries have made them public benefactors and brought them fame and fortune, are quite familiar to all readers. It is scarcely necessary to speak of Benjamin Franklin, who first unraveled some of the mysteries of electricity; of Robert Fulton, who designed the first steam-boat; of Elias Howe, who invented the sewing machine; of Charles Goodyear, discoverer of the rubber combination; of Samuel F. B. Morse, who invented the telegraph; or of Cyrus H. McCormick, inventor of the great harvesting machine. These and many others, including Eli Whitney, inventor of the cotton-gin; Thomas Blanchard, who patented the tack machine, and John Ericsson, who designed the

screw-propeller for vessels, and invented the iron-clad monitor, all occupy a place of honor in our school text-books and encyclopædias. Among the illustrious inventors of more recent years Thomas A. Edison stands first. Mr. Edison was born in Ohio, in 1847, and is, therefore, now but 45 years of age. In boyhood he was a printer's "devil," in youth a telegraph operator, and in early manhood the inventor of the quadruplex telegraph, the incandescent light, and many other electric and scientific appliances. Nearly six hundred and fifty patents have been granted to him, and he is still at work upon important problems. Among his latest and most wonderful productions is the phonograph. Alexander Graham Bell, who patented the telephone, was born



PROMINENT INVENTORS.

in Scotland. He is a noted writer on scientific subjects, but has never ranked as an inventor, the telephone comprising his only patent, from which great wealth to himself and associates has resulted. Richard M. Hoe, the great printing-press inventor, was born in New York in 1812. His father, who was the first American machinist to use steam, was partner of Matthew Smith, inventor of a hand printing press which Hoe improved. Afterwards young Hoe made many inventions and improvements until he finally produced the wonderful rotary presses into which were fed ribbons of paper five miles long at the rate of 800 feet a minute, which other mechanisms cut, pasted, and folded. Robert Bruce, inventor of the type casting machine, was also born in New York, and is still living at the age of 89. Previous to his inventions, the casting of type was a hand process by which fifteen pieces per minute could be produced. After several trials he devised an improved machine which produces 140 pieces per minute, and this machine is now in use by all the foundries, the sale of patents having brought the inventor a handsome fortune. Christopher Latham Sholes, the actual inventor of the Remington typewriter, was born in Pennsylvania in 1819, and died at Milwaukee, Wis., in 1890.

In early life he was a printer's apprentice, and later held several important public positions. In 1867 he completed the first crude model of the typewriter, in the patenting of which others were associated with him. For seven years thereafter he continued work upon the machine, making many improvements and taking out new patents until it was finally brought to its present state of perfection. Thaddeus Fairbanks, inventor of the scales which bear his name and are in use the world over, was born in Massachusetts, in 1797, and died in 1886. He was early of a mechanical turn and while employed in the business of dressing hemp observed the defects in the scales then in use and began, in 1822, to work upon the invention which he finally perfected by various stages. George M. Pullman, patentee of the Pullman palace sleeping and vestibule cars, was born in New York, in 1831. At fourteen years of age he was clerk in a country store, and ten years later was a contractor for moving warehouses in widening the Erie canal. Afterwards he went to Chicago, and was the first to apply machinery to raising whole blocks of stone or brick. In 1859 he began experimenting with his improvements in railway coaches and has since obtained a number of patents.

WHAT IS PATENTABLE.

NOT everything that is new is patentable. In the language of the statute: "Any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter or any new and useful

use thereof, not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, and not in public use or on sale for more than two

years prior to his application, unless the same is proved to have been abandoned, may upon payment of the fees required by law, and other due proceedings had, obtain a patent therefor." The subject of the patent must have been "invented or discovered." Neither of these words is used quite in a dictionary sense. They refer to inventions having industrial value. *Mere* discovery is not patentable; as, for instance, a miner could not patent the discovery that oil is found in the fissures of certain rocks, but he might patent a method of removing the oil or some new torpedo especially adapted to operate in an oil well—that is to say, a principle is not patentable, but a mode, method, or means of seizing upon the principle and putting it into service may be patented. The time or labor spent in the completion of the invention is not a factor of patentability. It is the *result*, whether the outcome of years of scientific research or of the happy thought of an instant. To say that an invention must be "useful," means that it must have some industrial value and be operative. A perpetual motion apparatus is not useful, nor is a spark arrester, which does its work so vigorously as to stop the locomotive.

The statute divides patentable subject-matter into four classes: "Art, machine, manufacture, composition of matter." The term "art" is intended to include those methods and processes which embody an act or a series of acts that may be carried out by hand or without reference to any especial mechanism, such as the methods and processes which form a large part of the acts of dyeing, tanning, and

refining oil, etc. A "machine" is a body, or an assemblage or combination of mechanical parts adapted to receive, transmit and modify force or motion, to do work. This term includes the great majority of inventions, for a transom-lifter answers the definition as well as a printing-press. The function of a machine is often claimed as a method, but it is not patentable. The planing of a board, the weaving of a fabric, or any mere operation of a machine, accompanies the machine and may not be patented as a "method." An "article of manufacture" is an article or fabric made as a finality, and not having any rule of action such as is found in machines and not involving the relation of ingredients: as for example, a woven-wire door-mat, a chain, a pen-holder, a plow-point, a lamp-chimney. A "composition of matter" is a compound of two or more ingredients forming a homogeneous whole; as a paint, a glue, an ink. The statute recites certain bars. The invention must not have been previously known or used by others in this country. A single use by another would negative novelty even though the invention be hidden from sight; as a bolt in a safe or a feed-clamp in an arc-light. To get a valid patent the patentee must be the *inventor* of the device, but his own use thereof for two years before applying for a patent does not affect his claim. No amount of foreign use will affect patentability; as, where a certain tenon for window-slats was shown to have been used for three hundred years on the church to which Luther nailed his theses, it was held not a bar. But the invention must not have been patented or

described in any printed publication in this or any foreign country. Only what is *claimed* is patented. Other matter of description is cited as a publication. The age or language of the reference is immaterial. Virgil and the Bible have been frequently cited. The two bars just named cover want of novelty. There are two others which fall under the technical term of *lache*. The first is public use or sale for more than two years prior to the application; that is, use in public or by the public in the way of business, or an offer for sale or actual selling, with or without the consent and allowance of the inventor. The use of a corset-steel for

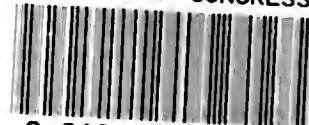
eleven years by a lady who afterwards married the inventor was held to be public use. But use in public for experimental purposes is not public use; as in case of the Nicholson pavement, which was tried six years near a toll-gate without losing right to patent. The other bar is abandonment—that is, the surrender of the invention to the public, or failure to prosecute for a specified time. Abandonment is never presumed, but is a question of fact. A patent is granted for seventeen years, but may be limited to expire with a foreign patent for the same invention by the same inventor.

ABOUT PROCURING PATENTS.

EVERY person who has made an invention or discovery for which a patent is desired should first of all consult, personally or by letter, some first-class patent lawyer and expert. While it is not in any case advisable to attempt to institute any proceedings whatever until competent advice has been obtained, it is also very important that great care be exercised in the selection of an attorney. There are numbers of patent solicitors in Washington and elsewhere, some of whom are qualified by previous study, training, and experience to prosecute the most complicated case from its inception before the Examiner to an infringement trial before the courts, if necessary. But there are also some so-called attorneys who possess no such qualifica-

tions. To obtain a valid and valuable patent in these days of multiplied inventions the highest skill in the preparation of claims and specifications is necessary. The cheap and unskilled solicitor may possibly, for the sake of his fee, get an allowance on one or two loosely-drawn claims, but these may often in the end be found practically worthless, and the patentee involved in litigation, expense, and disappointment. It is an easy matter to learn where the competent attorneys are. The Patent Office does not recommend particular attorneys, and it is a waste of time to address the Office for such information, but the officials decidedly prefer that every application for a patent shall be presented in the best and most thorough manner.

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